

**IN THE CLAIMS**

Please amend the claims as follows. Any additional differences between the previous state of the claims and the claims below are unintentional and in the nature of typographical errors.

1. (Currently Amended) A method, comprising:  
receiving a matrix comprising a first plurality of samples associated with a first signal and a second plurality of samples associated with a second signal, the second signal comprising a first portion associated with the first signal and a second portion associated with at least one disturbance;  
projecting the matrix into an orthogonal space; [[and]]  
using the projected matrix to at least partially isolate the first portion of the second signal from the second portion of the second signal; and  
generating and storing a model associating the first signal and the isolated first portion of the second signal;  
wherein the matrix comprises (i) a first column Hankel matrix comprising the first plurality of samples in a first portion of the matrix and (ii) a second column Hankel matrix comprising the second plurality of samples in a second portion of the matrix; and  
wherein the first column Hankel matrix comprises one of a backward column Hankel matrix and a forward column Hankel matrix, and the second column Hankel matrix comprises one of a backward column Hankel matrix and a forward column Hankel matrix.

2. (Original) The method of Claim 1, wherein projecting the matrix comprises performing canonical QR-decomposition on the matrix, the canonical QR-decomposition creating an orthogonal matrix and an upper triangular matrix.

3. (Original) The method of Claim 2, wherein:  
the upper triangular matrix has a plurality of values along a diagonal of the matrix, each value being greater than or equal to zero; and  
the diagonal lies between an upper left corner and a lower right corner of the upper triangular matrix.

4. (Original) The method of Claim 1, wherein projecting the matrix comprises projecting the first signal along with the second signal.

5. (Previously Presented) The method of Claim 1, further comprising generating the matrix comprising the first and second plurality of samples.

6. (Previously Presented) The method of Claim 1, wherein:  
the first column Hankel matrix comprises a backward column Hankel matrix; and  
the second column Hankel matrix comprises a forward column Hankel matrix.

7. (Cancelled).

8. (Currently Amended) A method, comprising: ~~The method of Claim 1,~~  
~~wherein the matrix comprises a first matrix, the first matrix containing a first segment of~~  
~~samples; and~~

receiving a first matrix containing a first segment of samples including a first plurality of  
samples associated with a first signal and a second plurality of samples associated with a second  
signal, the second signal comprising a first portion associated with the first signal and a second  
portion associated with at least one disturbance;

projecting the first matrix into an orthogonal space to form an upper triangular matrix;

~~further comprising:~~

receiving a second matrix containing a second segment of samples;

concatenating the second matrix with ~~[[an]]~~ the upper triangular matrix ~~associated with~~  
~~the first matrix~~ to form a concatenated matrix; ~~[[and]]~~

projecting the concatenated matrix;

using the projected concatenated matrix to at least partially isolate the first portion of the  
second signal from the second portion of the second signal; and

generating and storing a model associating the first signal and the isolated first portion of  
the second signal.

9. (Original) The method of Claim 8, wherein concatenating the second matrix  
with the upper triangular matrix comprises multiplying values in the upper triangular matrix by a  
forgetting factor.

10. (Previously Presented) The method of Claim 8, wherein the at least one disturbance comprises at least one of: white noise and colored noise.

11. (Currently Amended) An apparatus, comprising:  
at least one memory storing a matrix comprising a first plurality of samples associated with a first signal and a second plurality of samples associated with a second signal, the second signal comprising a first portion associated with the first signal and a second portion associated with at least one disturbance; and

at least one processor:

performing canonical QR-decomposition on the matrix, the canonical QR-decomposition creating an orthogonal matrix and an upper triangular matrix, the upper triangular matrix having a plurality of values along a diagonal of the matrix, each value being greater than or equal to zero, the diagonal lying between an upper left corner and a lower right corner of the upper triangular matrix; [[and]]

using the orthogonal matrix and the upper triangular matrix to at least partially isolate the first portion of the second signal from the second portion of the second signal; and

generating and storing a model associating the first signal and the isolated first portion of the second signal;

wherein the matrix comprises (i) a first column Hankel matrix comprising the first plurality of samples in a first portion of the matrix and (ii) a second column Hankel matrix comprising the second plurality of samples in a second portion of the matrix; and

wherein the first column Hankel matrix comprises one of a backward column Hankel matrix and a forward column Hankel matrix, and the second column Hankel matrix comprises one of a backward column Hankel matrix and a forward column Hankel matrix.

12. (Previously Presented) The apparatus of Claim 11, wherein performing the canonical QR-decomposition allows the at least one processor to project the matrix into an orthogonal space so as to at least partially isolate the first portion of the second signal from the second portion of the second signal.

13. (Original) The apparatus of Claim 12, wherein the at least one processor is operable to generate a projection that includes the first signal, the first portion of the second signal, and the second portion of the second signal.

14. (Previously Presented) The apparatus of Claim 11, wherein the at least one processor is further operable to generate the matrix comprising the first and second plurality of samples.

15. (Previously Presented) The apparatus of Claim 11, wherein:  
the first column Hankel matrix comprises a backward column Hankel matrix; and  
the second column Hankel matrix comprises a forward column Hankel matrix.

16. (Currently Amended) An apparatus, comprising: ~~The apparatus of Claim 11, wherein:~~

~~the matrix comprises a first matrix, the first matrix containing a first segment of samples;~~  
and

at least one memory storing a first matrix containing a first segment of samples including a first plurality of samples associated with a first signal and a second plurality of samples associated with a second signal, the second signal comprising a first portion associated with the first signal and a second portion associated with at least one disturbance, wherein the first matrix comprises (i) a first column Hankel matrix comprising the first plurality of samples in a first portion of the first matrix and (ii) a second column Hankel matrix comprising the second plurality of samples in a second portion of the first matrix; and

[[the]] at least one processor; ~~is further operable to:~~

performing canonical QR-decomposition on the first matrix to form a first upper triangular matrix;

receiving [[e]] a second matrix containing a second segment of samples;

concatenating [[e]] the second matrix with [[an]] the first upper triangular matrix associated with the first matrix to form a concatenated matrix; [[and]]

performing [[e]] canonical QR-decomposition on the concatenated matrix to form an orthogonal matrix and a second upper triangular matrix, the second upper triangular matrix having a plurality of values along a diagonal of the matrix, each value being greater than or equal to zero, the diagonal lying between an upper left corner and a lower right corner of the second

upper triangular matrix;

using the orthogonal matrix and the second upper triangular matrix to at least partially isolate the first portion of the second signal from the second portion of the second signal; and

generating and storing a model associating the first signal and the isolated first portion of the second signal.

17. (Currently Amended) The apparatus of Claim 16, wherein the at least one processor is further operable to multiply values in the first upper triangular matrix by a forgetting factor.

18. (Currently Amended) A computer program embodied on a computer readable medium, the computer program comprising:

computer readable program code ~~for generating~~ that generates a matrix comprising a first plurality of samples associated with a first signal and a second plurality of samples associated with a second signal, the second signal comprising a first portion associated with the first signal and a second portion associated with at least one disturbance;

computer readable program code ~~for decomposing~~ that decomposes the matrix so as to form a projection of the matrix in an orthogonal space; [[and]]

computer readable program code ~~for using~~ that uses the projection to at least partially isolate the first portion of the second signal from the second portion of the second signal; and

computer readable program code that generates and stores a model associating the first signal and the isolated first portion of the second signal;

wherein the matrix comprises (i) a first column Hankel matrix comprising the first plurality of samples in a first portion of the matrix and (ii) a second column Hankel matrix comprising the second plurality of samples in a second portion of the matrix; and

wherein the first column Hankel matrix comprises one of a backward column Hankel matrix and a forward column Hankel matrix, and the second column Hankel matrix comprises one of a backward column Hankel matrix and a forward column Hankel matrix.



19. (Currently Amended) The computer program of Claim 18, wherein the computer readable program code ~~for decomposing~~ that decomposes the matrix comprises computer readable program code ~~for performing~~ that performs canonical QR-decomposition on the matrix, the canonical QR-decomposition creating an orthogonal matrix and an upper triangular matrix.

20. (Original) The computer program of Claim 19, wherein:  
the upper triangular matrix has a plurality of values along a diagonal of the matrix, each value being greater than or equal to zero; and  
the diagonal lies between an upper left corner and a lower right corner of the upper triangular matrix.

21. (Original) The computer program of Claim 18, wherein the projection of the matrix comprises a projection of the first signal, the first portion of the second signal, and the second portion of the second signal.

22. (Previously Presented) The computer program of Claim 18, wherein:  
the first column Hankel matrix comprises a forward column Hankel matrix; and  
the second column Hankel matrix comprises a backward column Hankel matrix.

23. (Previously Presented) The computer program of Claim 18, wherein:  
the first column Hankel matrix comprises a backward column Hankel matrix; and  
the second column Hankel matrix comprises a forward column Hankel matrix.

24. (Currently Amended) A computer program embodied on a computer readable medium, the computer program comprising: ~~The computer program of Claim 18, wherein the matrix comprises a first matrix, the first matrix containing a first segment of samples; and~~

computer readable program code that generates a first matrix containing a first segment of samples including a first plurality of samples associated with a first signal and a second plurality of samples associated with a second signal, the second signal comprising a first portion associated with the first signal and a second portion associated with at least one disturbance;

computer readable program code that decomposes the matrix so as to form an upper triangular matrix;

~~further comprising computer readable program code for:~~

computer readable program code that receives ~~receiving~~ a second matrix containing a second segment of samples;

computer readable program code that concatenates ~~eoneatenating~~ the second matrix with  
[[an]] the upper triangular matrix associated with the first matrix to form a concatenated matrix;  
[[and]]

computer readable program code that decomposes ~~decomposing~~ the concatenated matrix  
so as to form a projection of the concatenated matrix;

computer readable program code that uses the projection of the concatenated matrix to at  
least partially isolate the first portion of the second signal from the second portion of the second  
signal; and

computer readable program code that generates and stores a model associating the first  
signal and the isolated first portion of the second signal;

wherein the matrix comprises (i) a first column Hankel matrix comprising the first  
plurality of samples in a first portion of the matrix and (ii) a second column Hankel matrix  
comprising the second plurality of samples in a second portion of the matrix.

25. (Currently Amended) The computer program of Claim 24, wherein the  
computer readable program code ~~for concatenating~~ that concatenates the second matrix with the  
upper triangular matrix comprises computer readable program code ~~for multiplying~~ that  
multiplies values in the upper triangular matrix by a forgetting factor.

26. (Currently Amended) A system, comprising:

a monitored system operable to receive a first signal and provide a second signal, the second signal comprising a first portion associated with the first signal and a second portion associated with at least one disturbance; and

a controller comprising one or more hardware components, the controller operable to:

produce a matrix comprising a first plurality of samples associated with the first signal and a second plurality of samples associated with the second signal;

decompose the matrix so as to form a projection in an orthogonal space; [[and]]

use the projection to at least partially isolate the first portion of the second signal from the second portion of the second signal; and

generate and store a model associating the first signal and the isolated first portion of the second signal;

wherein the matrix comprises (i) a first column Hankel matrix comprising the first plurality of samples in a first portion of the matrix and (ii) a second column Hankel matrix comprising the second plurality of samples in a second portion of the matrix; and

wherein the first column Hankel matrix comprises one of a backward column Hankel matrix and a forward column Hankel matrix, and the second column Hankel matrix comprises one of a backward column Hankel matrix and a forward column Hankel matrix.

27. (Currently Amended) A method, comprising:

performing canonical QR-decomposition on a matrix, the canonical QR-decomposition creating an orthogonal matrix and an upper triangular matrix; [[and]]

using the orthogonal matrix and the upper triangular matrix to at least partially isolate one or more effects of one or more disturbances in a signal; and

generating and storing a model associated with the signal that has had the one or more effects of the one or more disturbances isolated;

wherein the upper triangular matrix has a plurality of values along a diagonal of the upper triangular matrix, each value being greater than or equal to zero, the diagonal lying between an upper left corner and a lower right corner of the upper triangular matrix; [[and]]

wherein the matrix comprises a first column Hankel matrix in a first portion of the matrix and a second column Hankel matrix in a second portion of the matrix; and

wherein the first column Hankel matrix comprises one of a backward column Hankel matrix and a forward column Hankel matrix, and the second column Hankel matrix comprises one of a backward column Hankel matrix and a forward column Hankel matrix.

28. (New) The method of Claim 1, further comprising:

controlling at least a portion of a process using the model.